

CLAIMS

1. A preparation of encapsulated bioavailable chelating agents comprised of the following ingredients:

a) one or more members selected from a first group consisting of: R-(+)-.alpha.-lipoic acid, S-(-)-.alpha.-lipoic acid, R/S-.alpha.-lipoic acid, R/S-.gamma.-lipoic acid, other isomers of alpha lipoic acid, dihydrolipoic acid or DHLA, animal and vegetable oils, hydrocarbon oils, ester oils, silicone oils, higher fatty acids, higher alcohols, sunscreens agents, vitamins, and ferulic acid; wherein at least 10% of said one or more members from said first group is in microspheres or liposomes; and

b) one or more members selected from a second group consisting of: EDTA, EGTA, DPTA, TTHA, HEDHA, NOTA, DOTA, HEDTA, other polyaminopolycarboxylic acids, iminodiacetic acid (IDA), cyclam, penicillamine, dimercaptosuccinic acid, tartrate, thiomalic acid, crown ethers, nitrilotriacetate acid (NTA), 3,6-dioxaoctanedithioamide, 3,6-dioxaoctanediamide, salicyladoximine, dithio-oxamide, 8-hydroxyquinoline, cupferron, 2,2'-thiobis(ethyl acetoacetate), 2,2'-dipyridyl, and derivatives thereof; wherein at least 1% of said one or more members from said second group is in microspheres or liposomes; wherein at least 10% of said one or more members from said second group is in microspheres or liposomes; and

c) one or more members selected from a third group consisting of: lecithin, phosphatidylcholine, phosphatidylserine, phosphatidylethanolamine, dilinoleylphosphatidylcholine, lysolipids, dipalmitoylphosphatidylcholine, distearoylphosphatidylcholine, phosphatidylcholine, phosphatidic acid, sphingomyelin,

cholesterol, cholesterol sulfate, cholesterol hemisuccinate, tocopherol hemisuccinate, phosphatidylethanolamine, phosphatidylinositol, fatty acids, palmitic acid, stearic acid, oleic acid, linolenic acid, limoleic acid, glycosphingolipids, glucolipids, glycolipids, sulphatides, lipids bearing sulfonated mono-, di-, oligo- or polysaccharides, lipids with ether and ester-linked fatty acids, triglycerides, lipoproteins, cholesterol, and other lipids or polymerized lipids; wherein at least 10% of said one or more members from said third group is in microspheres or liposomes; and

wherein said or more members selected from said first group, and said or more members selected from said second group members, and said or more members selected from said third group have been admixed and subjected to a procedure to create microspheres or liposomes.

2. A preparation of encapsulated bioavailable chelating agents comprised of the following ingredients:

- a) one or more members selected from a first group consisting of: R-(+)-.alpha.-lipoic acid (substantially enantiomerically pure), S-(-)-.alpha.-lipoic acid (substantially enantiomerically pure), R/S-.alpha.-lipoic acid (racemic mixture), R/S-.gamma.-lipoic acid (racemic mixture), other isomers of alpha lipoic acid, derivatives of alpha lipoic acid (such dihydrolipoic acid or DHLA); wherein at least 25% of said one or more members from said first group is in microspheres or liposomes; and
- b) one or more members selected from a second group consisting of: EDTA, EGTA, DPTA, TTHA, HEDHA, NOTA, DOTA, HEDTA, other polyaminopolycarboxylic acids, iminodiacetic acid (IDA), cyclam, penicillamine, dimercaptosuccinic acid, tartrate, thiomalic

acid, crown ethers, nitrilotriacetic acid (NTA), 3,6-dioxaoctanedithioamide, 3,6-dioxaoctanediamide, salicyladoximine, dithio-oxamide, 8-hydroxyquinoline, cupferron, 2,2'-thiobis(ethyl acetoacetate), 2,2'-dipyridyl; wherein at least 25% of said one or more members from said second group is in microspheres or liposomes; and

c) one or more members selected from a third group consisting of:

lecithin, phosphatidylcholine, phosphatidylserine, phosphatidylethanolamine, dilinoleylphosphatidylcholine, lysolipids, dipalmitoylphosphatidylcholine, distearoylphosphatidylcholine, phosphatidylcholine, phosphatidic acid, sphingomyelin, cholesterol, cholesterol sulfate, cholesterol hemisuccinate, tocopherol hemisuccinate, phosphatidylethanolamine, phosphatidylinositol, palmitic acid, stearic acid, oleic acid, linolenic acid, linoleic acid; wherein at least 25% of said one or more members from said third group is in microspheres or liposomes.